



**UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/003.075 01/05/98 MONTGOMERY

D 01665-0004.9

EXAMINER

IM52/0601

HOWREY & SIMON

BOX NO 34

1299 PENNSYLVANIA AVENUE NW

WASHINGTON DC 20004-2402

SARANTHICKS PER NUMBER

6

DATE MAILED:

06/01/99

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

# Notice of Allowability

Application No.  
09/003,075

Applicant(s)  
Donald Montgomery

Examiner  
Erica Smith-Hicks

Group/Art Unit  
1741



All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance and Issue Fee Due or other appropriate communication will be mailed in due course.

- ☒ This communication is responsive to Application filed January 5, 1998
- ☒ The allowed claim(s) is/are 1, 3-9, 11-47, and 49-51
- ☒ The drawings filed on Jan 5, 1998 are acceptable.
- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- ☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been
- ☐ received.
- ☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_
- ☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

- ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

A SHORTENED STATUTORY PERIOD FOR RESPONSE to comply with the requirements noted below is set to EXPIRE **THREE MONTHS** FROM THE "DATE MAILED" of this Office action. Failure to timely comply will result in ABANDONMENT of this application. Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

- ☐ Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL APPLICATION, PTO-152, which discloses that the oath or declaration is deficient. A SUBSTITUTE OATH OR DECLARATION IS REQUIRED.
- ☐ Applicant MUST submit NEW FORMAL DRAWINGS
- ☐ because the originally filed drawings were declared by applicant to be informal.
- ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review, PTO-948, attached hereto or to Paper No. \_\_\_\_\_
- ☐ including changes required by the proposed drawing correction filed on \_\_\_\_\_, which has been approved by the examiner.
- ☐ including changes required by the attached Examiner's Amendment/Comment.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the reverse side of the drawings. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

- ☐ Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Any response to this letter should include, in the upper right hand corner, the APPLICATION NUMBER (SERIES CODE/SERIAL NUMBER). If applicant has received a Notice of Allowance and Issue Fee Due, the ISSUE BATCH NUMBER and DATE of the NOTICE OF ALLOWANCE should also be included.

## Attachment(s)

- ☒ Notice of References Cited, PTO-892
- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 4
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Notice of Informal Patent Application, PTO-152
- ☒ Interview Summary, PTO-413
- ☒ Examiner's Amendment/Comment
- ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
- ☒ Examiner's Statement of Reasons for Allowance

Art Unit: 1741

### EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Atty. Allan Halluin on May 24, 1999.

2. The application has been amended as follows:

Claims 1 and 47 have been amended to include the limitation of claims 2 and 48

respectively:

(Amended) 1. A method for electrochemical placement of a material at a specific location on a substrate, which comprises the steps of :

providing a substrate having at its surface at least one electrode that is proximate to at least one molecule bearing at least one protected chemical functional group,

placing a buffering or scavenging solution in contact with the electrode at the surface of the substrate to prevent the electrochemically generated reagents from leaving the locality of the electrode,

Art Unit: 1741

applying a potential to the electrode sufficient to generate electrochemical reagents capable of deprotecting at least one of the protected chemical functional groups, and bonding the deprotected chemical functional group with a monomer or a pre-formed molecule.

<sup>45</sup>  
(Amended) 47. A method for electrochemical placement of a material at a specific location on a substrate, which comprises the steps of:

providing a substrate having at its surface at least one electrode that is proximate to at least one molecule that is reactive with an electrochemically generated reagent,

*az*  
placing a buffering or scavenging solution in contact with the electrode at the surface of the substrate to prevent the electrochemically generated reagents from leaving the locality of the electrode,

applying a potential to the electrode sufficient to generate electrochemical reagents capable of reacting to the at least one molecule proximate to the electrode, and producing a chemical reaction thereby.

*[Handwritten bracket on the left side of the text]*  
Amend page 38, lines 1-5 of the specification to spell out the full chemical terms for MOPS (morpholinopropanesulfonic acid), HEPES (4-[2-hydroxy ethyl] - 1 ~~pipirazine~~ <sup>pyrrolidine</sup> ethane sulfonic acid), TRIS (tris [hydroxy methyl] amino methane) and KI (potassium iodide) buffers.

*82*  
Claims <sup>2</sup> 2, 10 and ~~48~~ have been canceled.

Art Unit: 1741

3. The following is an examiner's statement of reasons for allowance: Upon a reasonable search of the prior art, the Examiner was unable to disclose a teaching of Applicant's method for solid phase synthesis of polymer sequences, that employs electrochemical techniques for the preparation of the polymers, and performs the electrochemical placement in the presence of a buffer solution. The prior art method most closely related to Applicant's invention is that of Southern, WO 93/22480. While Southern employs a similar technique, he fails to suggest the use of a buffer solution during the synthesis of oligomer. The method of Southern also requires highly accurate control of the electrode spacing for limiting the extent of diffusion of the electrochemically generated reagents away from the desired points of synthesis. Applicant's method offers an improvement over the prior art method of Southern as Applicant's electrode array allows for close positioning of the electrodes, without the need for electrode adjustment and readjustment. Applicant's electrode positioning effectively eliminates "chemical cross-talk" as a result of the presence of electrochemically generated reagents at undesired synthesis sites of the substrate. Still further, the inventive method's use of a highly efficient deprotection and coupling mechanism, and electrochemical synthesis in the presence of a buffering solution offers an advantage over the prior art methods as it allows for synthesis of a variety of chemical sequences at lower cost, and higher production rates using more efficient manufacturing equipment.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue

Art Unit: 1741

fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."


4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erica Smith-Hicks whose telephone number is (703) 305-7645. The examiner can normally be reached on Monday-Thursday from 8:30 a.m. to 6:00 p.m. and on alternate Fridays from 8:30 a.m. to 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kathryn Gorgos, can be reached on (703) 308-3328. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-7718 and for After Final faxes it is (703) 305-3599.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

ESH

May 24, 1999

  
Kathryn Gorgos  
Supervisory Patent Examiner  
Technology Center 1700



UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office

**NOTICE OF ALLOWANCE AND ISSUE FEE DUE**

IMS2/0601

HOWREY & SIMON  
BOX NO 34  
1229 PENNSYLVANIA AVENUE NW  
WASHINGTON DC 20004-2402

APPLICATION NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
09/003,075	01/05/98	048	SMITH HICKS, F 1741	06/01/99
First Named Applicant	MONTGOMERY, 35 USC 154(b) term ext. = 0 Days			

TITLE OF INVENTION  
ELECTROCHEMICAL SOLID PHASE SYNTHESIS

ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
1	01665.0004.9	205-122.000	T75	UTILITY	NO	\$1210.00 09/01/99

**THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED.**

**THE ISSUE FEE MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED.**

**HOW TO RESPOND TO THIS NOTICE:**

**I. Review the SMALL ENTITY status shown above.**

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

- A. If the status is changed, pay twice the amount of the FEE DUE shown above and notify the Patent and Trademark Office of the change in status, or
- B. If the status is the same, pay the FEE DUE shown above.

If the SMALL ENTITY is shown as NO:

- A. Pay FEE DUE shown above, or
- B. File verified statement of Small Entity Status before, or with, payment of 1/2 the FEE DUE shown above.

**II. Part B-Issue Fee Transmittal should be completed and returned to the Patent and Trademark Office (PTO) with your ISSUE FEE. Even if the ISSUE FEE has already been paid by charge to deposit account, Part B Issue Fee Transmittal should be completed and returned. If you are charging the ISSUE FEE to your deposit account, section "4b" of Part B-Issue Fee Transmittal should be completed and an extra copy of the form should be submitted.**

**III. All communications regarding this application must give application number and batch number. Please direct all communications prior to issuance to Box ISSUE FEE unless advised to the contrary.**

**IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.**

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